SAFER
CONSUMER
PRODUCTS

Potential Health and Safety Impacts of Chemicals in Nail Products

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Overview

- DTSC 2012 sampling study
- New York Times articles
- Healthy nail programs
- DTSC SCP initiative
- HNSR legislation – AB2125
- Stakeholder engagement

DTSC Nail Product Sampling 2012 Study

- Limited in scope
  - Salon products from San Francisco Bay area distributors
  - No retail product samples
- Samples randomly collected
- 25 samples
- 12/25 products (48%) claimed to be free of at least one of the “toxic trio” chemicals

DTSC Nail Product Sampling 2012 Study

- Ten of the 12 products with “toluene-free” claims contained toluene as high as 17.7%
- Some products claiming to be free of toxic trio had higher detections of dibutyl phthalate (DBP)
- TPP identified in some products
  - Plasticizer used instead of DBP

DTSC's Current Efforts on Nail Products

- 2015-2017 Priority Product Work Plan
  - Beauty, personal care, hygiene
- Chemicals in nail products
  - Formaldehyde, dibutyl phthalate (DBP), and toluene
    - *The "toxic trio"*
  - Other Candidate Chemicals

Why Nail Products?

- Wide variety of chemicals
- Salon workers and consumers
  - Nail salon workers
    - *Language barriers*
    - *Limited education on chemical exposure from products*
    - *Limited use and/or availability of personal protective equipment*
    - *Often work in excess of 8-hour days and 40-hour work weeks*
  - Pregnant women
  - Children

Exposure Potential

- Contain volatile chemicals which may off-gas to indoor air
- Contain chemicals that may be absorbed dermally
- Exposure likely affected by:
  - Poor ventilation or lack of PPE use (i.e., gloves, dust masks)
  - Long work days/weeks
  - Number of clients in a given day/week
  - Meteorological conditions
  - Building properties
- Wide range of product types/categories

Product Types

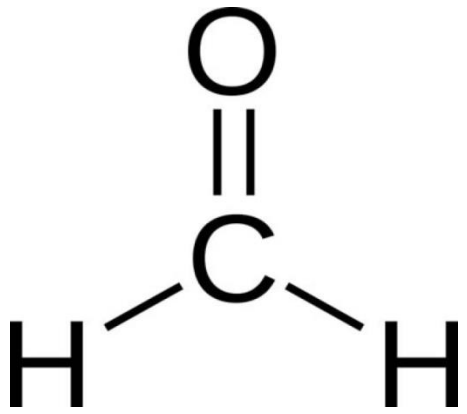
- Nail polish and coatings
- Base adhesives
- Nail hardeners
- Nail conditioners
- Artificial and gel nails
- Nail product thinners
- Nail polish removers
- Nail art

Toxic Trio and Triphenyl Phosphate

Chemical	Functional Use	Hazard Traits
Formaldehyde	Preservative, Antimicrobial, Nail Hardener	Carcinogenicity, Respiratory Toxicity, Ocular Toxicity
Toluene	Solvent, Supplemental Thinner	Developmental Toxicity, Neurotoxicity
Dibutyl phthalate (DBP)	Plasticizer	Endocrine Disruption, Developmental and Reproductive Toxicity, Immunotoxicity, Neurotoxicity
Triphenyl phosphate (TPP)	Plasticizer, Adhesive	Neurotoxicity, Reproductive Toxicity, Endocrine Disruption

Formaldehyde (CAS No. 50-0-0)

- Used as a preservative, antimicrobial, and nail hardener in select products
- FDA concentration limit at 5% for nail hardeners
- Human carcinogen
- Respiratory toxicant
- Eye irritant
- Dermal/allergic reactions



What is formaldehyde?

- Gas at room temperature
- Highly reactive with water
- Methylene glycol
  - Formaldehyde and water reaction
  - Distinct physicochemical properties
  - US EPA, ATSDR, FDA, Scientific Committee on Consumer Safety treat them interchangeably
- Formalin
  - Alternate name for % solution of methylene glycol
- Formaldehyde releasers
- Tosylamide formaldehyde resin

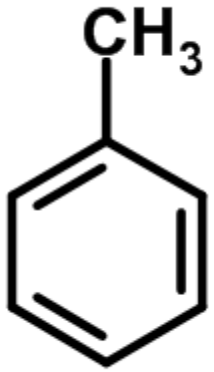
Formaldehyde – Questions of interest

- How is formaldehyde added into nail products?
  - At what concentrations?
- Does free formaldehyde escape from nail products into indoor air?
  - At what expected concentrations?
- Does free formaldehyde escape from the product once in solution as formalin/methylene glycol?

Formaldehyde – Questions of interest

- Does formaldehyde escape from formaldehyde-releasers or tosylamide formaldehyde resins into indoor air?
  - At what expected concentrations?
- To what extent is formaldehyde still being used in nail products?
  - What alternatives are being used or considered?

Toluene (CAS No. 108-88-3)



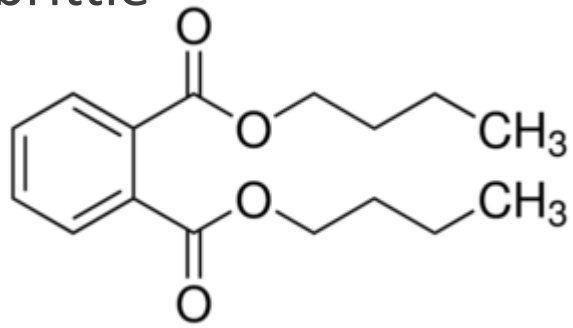
- Used as a solvent in nail products for ease in application
- Added as a thinner to products at nail salons
- Developmental toxicant
- Neurotoxicant
- Volatile with potential human inhalation exposure

Toluene – Questions of interest

- Is toluene still used in nail products and at what concentrations?
- How much thinner is added into products at nail salons and what is the final toluene product concentration?
- Are workers who add toluene-based solvents at the salon being exposed to a higher dose of toluene?
- How are nail products formulated that result in the need for toluene-based thinner being added at salons?

Dibutyl phthalate (CAS No. 84-74-2)

- In nail polish as plasticizer at concentrations of <10%
  - Reduces cracking by making polish less brittle
- Reproductive toxicant
- Developmental toxicant
- Potential endocrine disruptor
  - Cumulative contribution with other phthalates
- Dermal exposure is of most concern
- Banned for use in cosmetics in the European Union

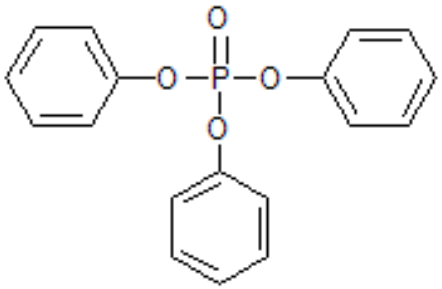


DBP Points of Discussion

- Is there any evidence that indicates human exposure to DBP from nail care products?
- What plasticizer alternatives are being used for DBP?
- Is TPP the preferred plasticizer or are others equally effective and in use?
- Are there alternatives assessments for nail polish plasticizers available?

Triphenyl Phosphate (CAS No. 115-86-6)

- Used as a plasticizer in nail products
  - Common alternative to DBP
- Potential endocrine disruptor
- Potential reproductive toxicant
- Dermal exposure is of most concern
  - Readily absorbed
- Frequency of use in nail products?
- Alternatives?



Toxic Trio/TPP Reported in Nail Products

	EWG Skin Deep Database	CDPH Safe Cosmetics Database
Formaldehyde	9	38
Toluene	10	48
Dibutyl phthalate	2	16
Triphenyl phosphate	366	n/a

http://www.cdph.ca.gov/programs/cosmetics/Documents/DataReport1.pdf

http://www.ewg.org/skindeep/

Additional Candidate Chemicals

- Acetone
- Acrylamide
- Benzophenone
- Butylated hydroxyanisole (BHA)
- Cocamide diethanolamine
- Diethanolamine
- Ethyl acrylate
- Lead
- Methyl isobutyl ketone (MIBK)
- N-Methylpyrrolidone (NMP)
- Tertiary butyl alcohol (TBA)
- Xylene
- Carbon black
- Talc
- Titanium dioxide
- Silica, crystalline
- Retinol/retinyl esters
- Others

http://www.cdph.ca.gov/programs/cosmetics/Documents/chemlist.pdf
http://www.dtsc.ca.gov/PollutionPrevention/upload/NailSalon_Final.pdf

Market and Regulatory Trends

- Public interest in safer products
- CA engaged in voluntary healthy nail salon programs
- Walmart has asked suppliers to remove “toxic trio” from supply chain
- Target’s new chemical strategy (01/2017)
  - Removal of phthalates and formaldehyde by 2020
- 3-free, 5-free, 7-free, and 9-free nail products
  - Products which do not contain “toxic trio” and other chemicals of interest

Chemical “Free” Nail Products

	3-Free	4-Free	5-Free	7-Free		8-Free	9-Free		10-Free
Formaldehyde	X	X	X	X	X	X	X	X	X
Toluene	X	X	X	X	X	X	X	X	X
Dibutyl phthalate	X	X	X	X	X	X	X	X	X
Camphor		X	X	X	X	X	X	X	X
Tosylamide/ formaldehyde resin			X	X	X	X	X	X	X
Xylene				X	X	X	X	X	X
Methyl ethyl ketone				X					
Parabens					X		X		X
Phthalates							X		X
Ethyl tosylamide						X	X	X	
Triphenyl phosphate						X		X	
Acetone								X	
Fragrance									X
Animal ingredients									X

Summary

- DTSC seeking input from stakeholders on chemicals in nail products due to:
  - Hazard traits associated with the “toxic trio” and awareness of other Candidate Chemicals in nail products
  - Potential exposure and adverse impacts to workers and consumers in California especially to pregnant women and children
  - Associated nail salon worker safety legislation